



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,601	02/15/2002	Pengfei Wu	301962.3000-100	1545
30407	7590	11/17/2004	EXAMINER	
BOWDITCH & DEWEY, LLP 161 WORCESTER ROAD P.O. BOX 9320 FRAMINGHAM, MA 01701-9320			ANGEBRANDT, MARTIN J	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/077,601

Applicant(s)

WU ET AL. TN

Examiner

Martin J Angebranndt

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2002.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-27 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 15 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/01/2002.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

Art Unit: 1756

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Toth et al. WO 00/33142.

Toth et al. WO 00/33142 teaches a holographic recording layer comprising side chain azobenzene polymers and their use in polarization holography with recording using blue or green light and readout using red light. (7/5-22).

4. Claims 1-4 and 6-7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Rao et al. '525.

Rao et al. '525 teach a holographic recording layer using two light sources with respect to figure 5. The use of various photochromic materials including azo dyes is disclosed. (6/54-60).

The blue and red lasers are used in the recording process. (13/33-44).

5. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Natansohn et al. '381.

Natansohn et al. '381 teach a holographic recording layer and recording information on the layer using linearly polarized light (7/38-8/12). The use of various photochromic materials including azo sidechain polymers is disclosed throughout.

With respect to claim 7, the functionality of the two wavelengths is not recited, therefore coupling for readout or writing meets the limitations.

6. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Savant et al. '221.

Savant et al. '221 teach a holographic recording layer and recording information on the layer using linearly or circularly polarized light. (7/38-8/12). The use of various photochromic materials including azo sidechain polymers and guest host systems with the azo dye dispersed in the polymeric matrix are disclosed (4/55-5/20 and 6/65-7/11). See example III and XIII-XX. Various manipulations of the polarization are taught (25/58-26/5). The use of different wavelengths (wavelength/color multiplexing) is disclosed. (26/35-44).

7. Claims 1-11 and 23-25 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Ishii et al. JP 2000-293849 (machine translation attached).

Ishii et al. JP 2000-293849 records plural holograms by modulating the polarization of the object beam (between s and p) (signal beam) so that adjacent areas have different types of holograms formed in them (figure 6 and 0018-0021, 0040-0051]. The technique uses azo containing polymers in the example (figure 2, 0040-0051)

The examiner holds that the light from each of the different pixel elements meets the limitation of first and second coherent light source, noting that the light emanating from these is coherent and the polarization is defined by them. They are apparent light sources with different polarization. The examiner notes that in claims 7 and 23, the light of different polarization does not have to be of different wavelengths, nor does the light have to be incident upon the same portion of the recording medium. In the holographic embodiments, the polarization of only one of the beams seems to be defined, which embrace polarization holograms which have different polarizations for the reference and object beams and conventional intensity holograms where these beams have the same polarization. The applicant may wish to include these limitations and/or specify the polarization of each beam to narrow the issues. The applicant should also point to the portion of the specification relied upon for this amendment.

8. Claims 7,12,14,16-21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kawakubo et al. JP 62-165751.

Kawakubo et al. JP 62-165751 teaches Langmuir Blodgett (LB) films (monolayers) where the recording layers have sensitivity to different wavelengths and/or polarizations. When recording at least one of these is changed to multiplex information in the recording medium.

The examiner notes that the materials used by Kawakubo et al. JP 62-165751 are not polymeric or azo compounds. The examiner also notes that the light of different polarizations and/or wavelengths activate different layers in the recording media. The examiner does not have a translation of this document (a machine translation is not available). If the applicant has a translation made, the examiner would appreciate a copy with the subsequent response. The examiner holds that as plural irradiation steps with specific polarizations are disclosed ( ie three

or more) the preilluminating step is met as the result of the preexposure is not set forth in the claims to preclude merely being additional recording steps. If the preexposure is meant to initialize the medium into the same state, the claims should recite this. The applicant should also point to the portion of the specification relied upon for this amendment.

It is not clear if the combination of different wavelength and polarization is used in the examiner as a translation is not present in the record. The examiner holds that the examples exemplifies this and anticipates the claims, or alternatively it would have been obvious to one skilled in the art to vary both wavelength and polarization

9. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. JP 2000-293849, in view of Kawakubo et al. JP 62-165751, Savant et al. '221 and Tsujioka et al. '900.

Tsujioka et al. '900 teach the use of beams with defined polarization to correspond to the fast axis of the birefringent layer. (5/65-6/52). The use of various photochromic materials including azo dyes and different wavelengths is disclosed (10/56-11/53). The use of stretching for initial orientation is disclosed. (12/48-58).

It would have been obvious to one skilled in the art to modify the invention of Ishii et al. JP 2000-293849 by using different wavelengths to add another dimension for multiplexing of information as taught by Kawakubo et al. JP 62-165751 and Savant et al. '221 with a reasonable expectation of being able to use this addition level of multiplexing based upon the different wavelengths used in converting between the cis and trans forms as taught by Tsujioka et al. '900. In a random orientation, the molecules can be in only three irreducible orientations, molecular axis oriented perpendicular to the page, oriented vertically in the plane of the page and

horizontally in the plane of the page. Linearly polarized light can only excite one of these (only about one third of the molecules) the use of circularly polarized light allows about  $\frac{1}{2}$  of the molecules to be excited.

10. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. JP 2000-293849, in view of Kawakubo et al. JP 62-165751, Savant et al. '221 and Tsujioka et al. '900, further in view of Tanigiuchi et al. JP 06-072050 and Taylor '251.

Tanigiuchi et al. JP 06-072050 teaches initialization of azo based optical recording media to place the azo dyes into a single conformation.

Taylor '251 teaches the use of various multiplexing techniques and the use of combination of these with respect to figures 1,1A,2,2A,3,3A where the use of spatial and angular multiplexing is shown (1/52-2/11 and 5/58-6/59).

In addition to the basis provided above, the examiner holds that it would have been obvious to one skilled in the art to modify the invention of Ishii et al. JP 2000-293849 as combined with Kawakubo et al. JP 62-165751, Savant et al. '221 and Tsujioka et al. '900 by orienting the medium using light initially as taught by Tanigiuchi et al. JP 06-072050 and to combine multiplexing techniques as is known in the art as evidenced by Taylor '251 to increase the information content of the medium.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kawano et al. '895 is similar to Ishii et al. JP 2000-293849.

JP 09-269719 teaches hologram where the object beams have different polarization and the reference beams is randomly polarized.

Yoshida et al. JP 63-259850 teach optical recording media using photochromic materials.

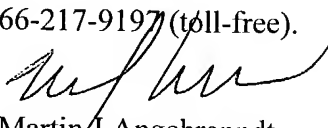
Ramanujam et al. WO 99/57719 (cited by applicant) teaches the use of polarization multiplexing for recording holograms.

Tahara et al. '048 teaches the use of color and polarizatio to multiplex information (figures, particularly 8a-8c)

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Martin J Angebranndt  
Primary Examiner  
Art Unit 1756

11/15/2004